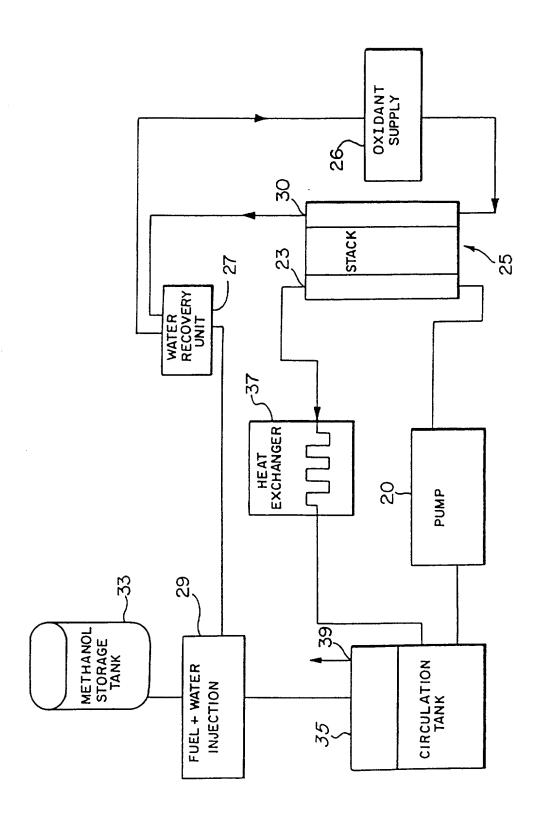
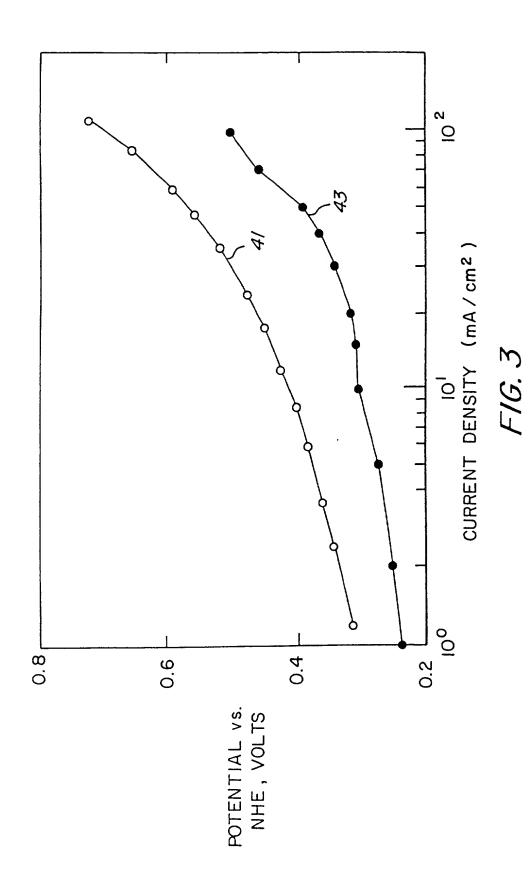


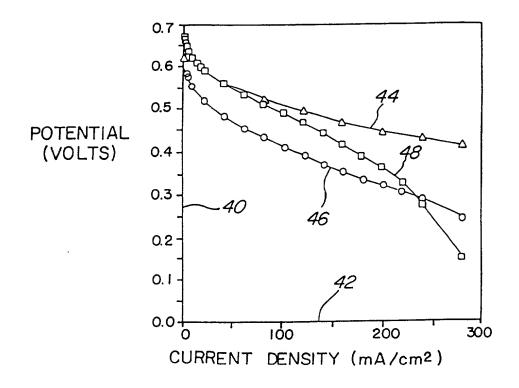
F/G. 4 1.0 0.9 8.0 0.7 36 VOLTAGE METH / OXYGEN (VOLTS) 0.6 *3*8 0.5 METH / AIR 0.4 0.3 0.2 34 0.1 0.0 100 40 80 20 60 0 CURRENT DENSITY  $(mA/cm^2)$ 

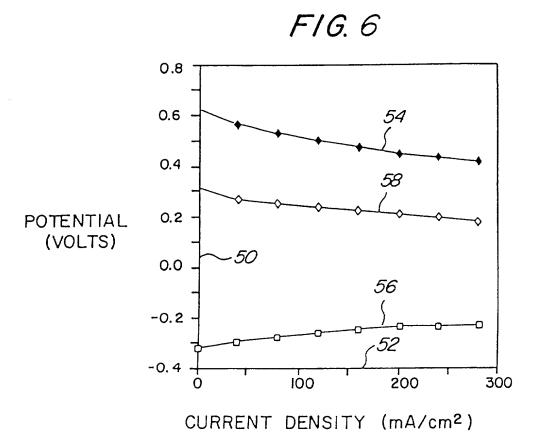


F16.2



F1G. 5





302

IMMERSE THE CARBON ELECTRODE STRUCTURE IN 1% SOLUTION OF NAFION IN METHANOL FOR ABOUT 5 MINUTES TO ACHIEVE IMPREGNATION OF THE NAFION INTO THE ELECTRODE TO A LOADING OF 0.1 – 0.5 mg/cm<sup>2</sup>.

304

REMOVE ELECTRODE FROM SOLUTION AND DRY IN VACUUM.

F1G. 7

F/G. //

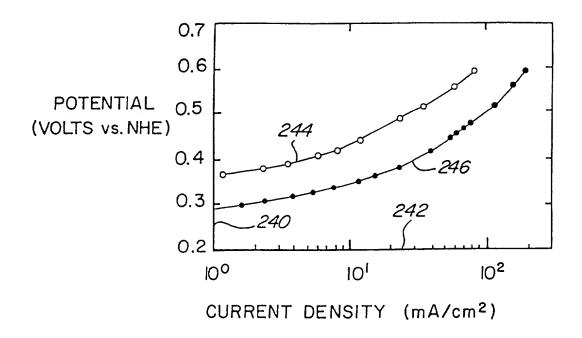
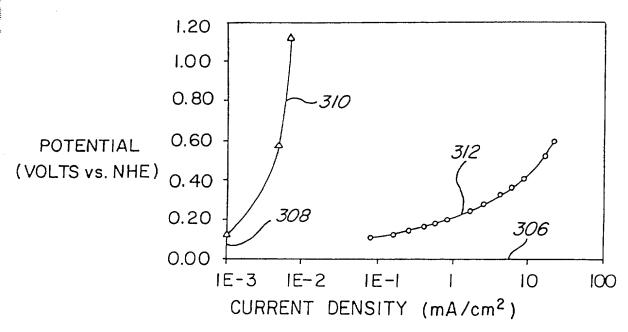


FIG. 8



PREPARE CARBON ELECTRODE STRUCTURES FROM A MIXTURE OF 200m2/g HIGH SURFACE AREA CARBON PARTICLES AND TEFLON BINDER (15%) APPLIED TO A FIBER-BASE CARBON PAPER.

-202

PREPARE A BATH OF HYDROGEN
HEXACHLOROPALTINATE AND POTASSIUM
PENTACHLOROAQUORUTHENIUM WITH A METAL
ION CONCENTRATION IN THE RANGE OF QOI-QO5M
DISSOLVED IN 1M SULFURIC ACID.

204

ADD PERFLUOROOCTANESULFONIC ACID TO BATH WITH A CONCENTRATION IN THE RANGE OF 0.1-1.0g1-1

<sub>1</sub>206

POSITION THE CARBON ELECTRODE IN THE BATH ALONG WITH A PLATINUM ANODE.

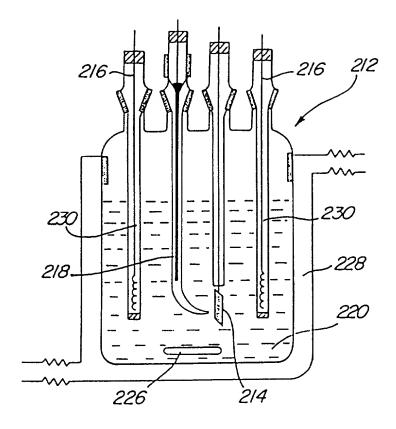
208

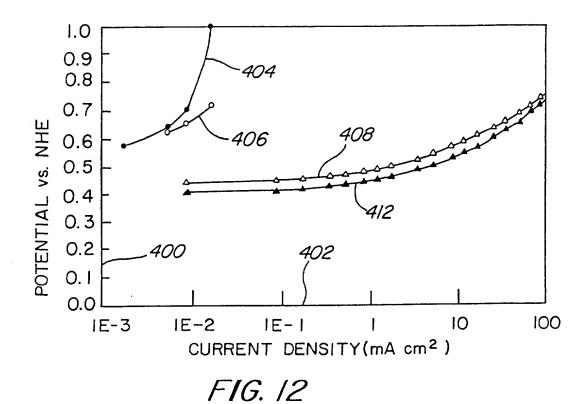
APPLY A VOLTAGE BETWEEN THE CARBON ELECTRODE AND THE ANODE FOR ABOUT 5-10 MINUTES TO ACHIEVE ELECTRODEPOSITION OF PLATINUM-RUTHENIUM TO A LOADING OF ABOUT 5mg/cm<sup>2</sup>.

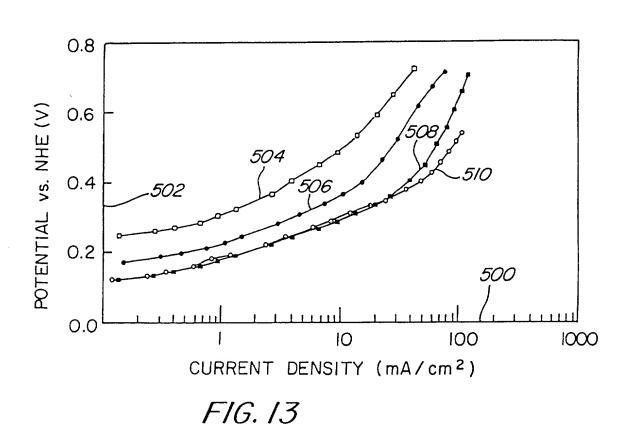
~210

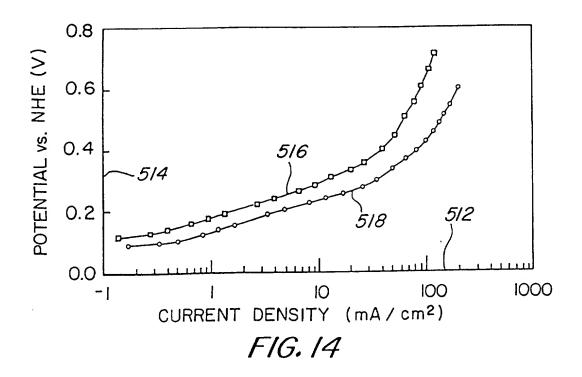
REMOVE CARBON ELECTRODES FROM BATH AND WASH IN DEIONIZED WATER.

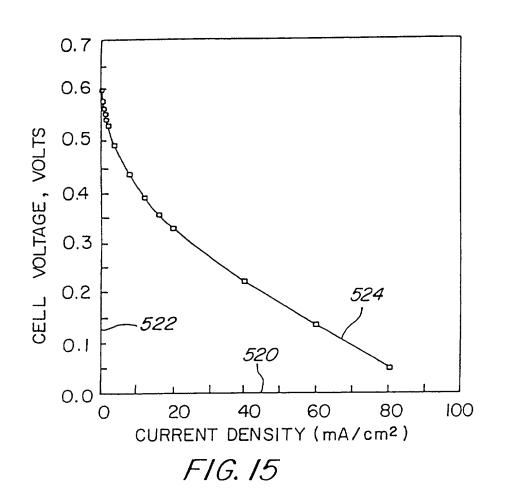
FIG. 10

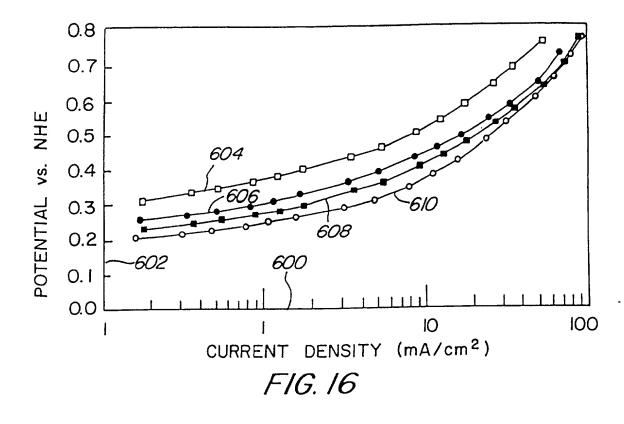


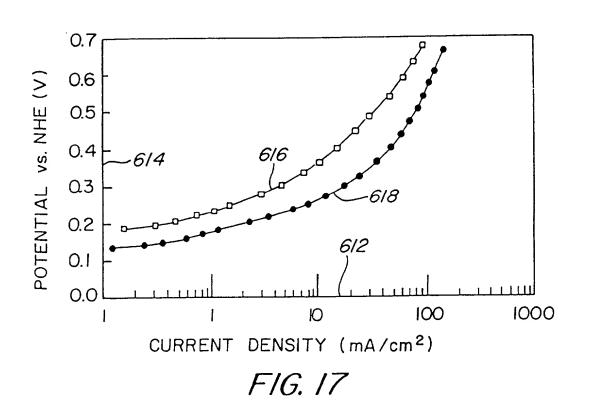


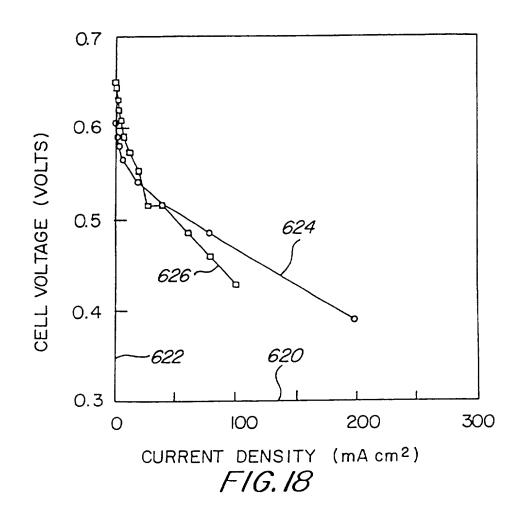


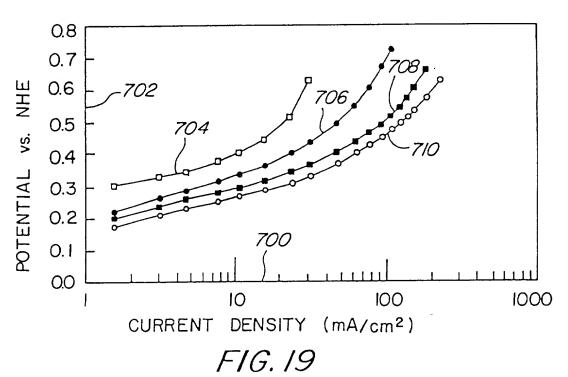












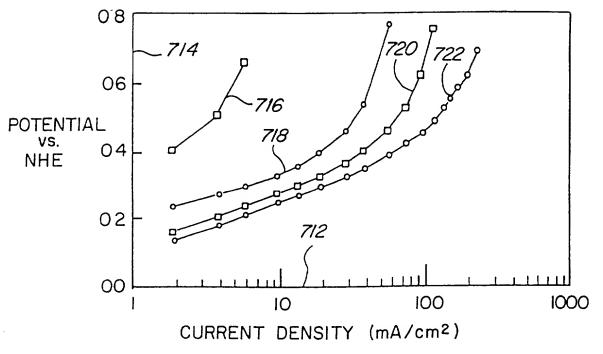


FIG. 20

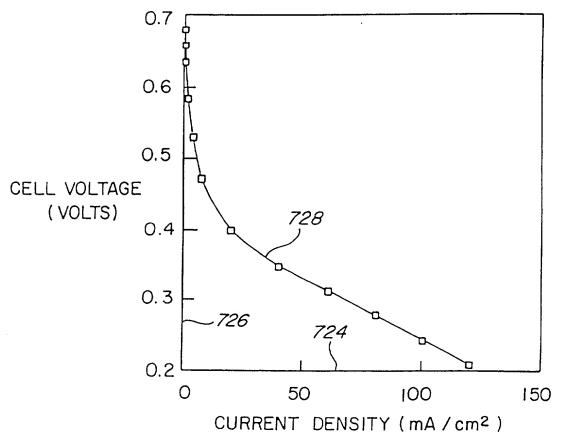


FIG. 21